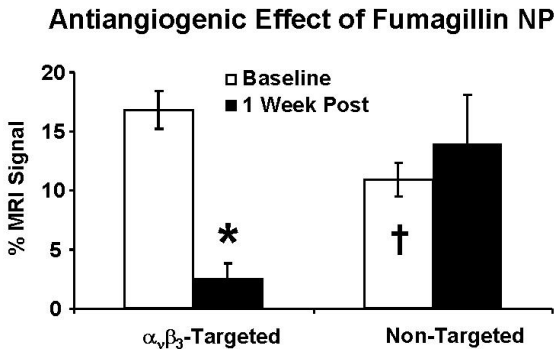


1055-156 **Assessment of Renal Artery Stenosis by 3-D Contrast-Enhanced and 3-D Phase-Contrast Magnetic Resonance Angiography: A Comparison With Conventional X-Ray Angiography**

Juan Carlos Rozo, Scott Flamm, Brenda Lambert, Vei-Vei Lee, Eduardo Hernandez, St. Luke's Episcopal Hospital/Texas Heart Institute, Houston, TX

**Background:** The purpose of this study was to evaluate the sensitivity and specificity of magnetic resonance angiography (MRA) using the combination of 3-D contrast-enhanced and 3-D phase-contrast imaging as a non-invasive diagnostic modality in patients with suspected renovascular hypertension when compared with conventional x-ray angiography.
**Methods:** 134 patients underwent renal MRA prior to conventional x-ray angiography were evaluated. Most patients were referred for MRA for further evaluation of renal insufficiency or difficult to control hypertension. MRAs were blindly evaluated independently by a single radiologist, and renal arteriograms were evaluated by a single interventional cardiologist.
**Results:** After exclusion of 19 renal arteries (7% of total renal arteries) due to prior stenting or lack of selective cannulation during angiography, a total of 249 main renal arteries were available for comparison. Polar arteries and branches were excluded from the analysis. The sensitivity and specificity for significant main renal artery stenosis defined as narrowing of $\geq$ 50 % was 90% and 91%, respectively. The positive and negative predictive values were 86 % and 94 %, respectively. The Pearson correlation coefficient was 0.84 (Prob > [r] under HO: RHO=0) for MRA when compared to conventional angiography.
**Conclusion:** Magnetic resonance angiography using the combination of 3-D contrast-enhanced and 3-D phase-contrast imaging is an excellent diagnostic tool in the assessment of patients with suspected renal artery stenosis.

POSTER SESSION

## 1056 Clinical Nuclear Studies

Sunday, March 07, 2004, 3:00 p.m.-5:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 4:00 p.m.-5:00 p.m.

1056-141 **Is There Value in Follow-Up Stress Testing for Emergency Department Patients With Chest Pain and Normal Rest SPECT Myocardial Perfusion?**

Prem Soman, Joni R. Beshanksky, Robin Ruthazer, John L. Griffith, Gary V. Heller, Robert C. Hendel, J.Hector Pope, Ethan J. Spiegler, James A. Feldman, Harry P. Selker, James E. Udelson, Tufts-New England Medical Center, Boston, MA

**Background***:* Normal rest myocardial perfusion imaging (MPI) in the emergency department (ED) is associated with a high negative predictive value for acute MI and ischemia, but how often follow-up testing is useful has not been studied.
**Methods**: The ERASE Chest Pain trial randomized 2,475 ED patients with suspected cardiac ischemia, no prior MI, and a non-diagnostic ECG to usual care, or care aided by the results of rest MPI, to determine the effect of the latter strategy on ED triage. A protocol-directed follow-up stress test was performed within 2 weeks (median 4 days) of the initial ED scan in 457 pts with a normal resting ED MPI in pts with no cardiac events. Of these, 123 (26%), 292 (63%) and 42 (9%) had treadmill exercise ECG testing only, exercise MPI, and pharmacological stress MPI, respectively.
**Results**: Stress tests were classified as definitely normal, definitely abnormal, non-specific or non-diagnostic. 43 pts (9%) demonstrated ischemia on stress testing, while 380 (80%) were classified as definitely normal. Using stepwise multivariable regression, age and known prior coronary artery disease (CAD) were found to be the clinical variables that predicted the presence of abnormal stress testing after normal rest MPI (p = 0.004 and 0.006, respectively). There was an interaction between age and CAD**:** among pts *without* prior CAD, the odds of an abnormal stress test increased with age (OR=1.5 per 10 year increase, p=0.0037), while among pts with prior CAD, there was no relationship between age and abnormal follow-up stress test (OR=0.79 per 10 year increase, p=0.39). Gender, history of diabetes, presence of chest pain during tracer injection for the ED scan, and presence of symptoms in the ED did not influence the prevalence of ischemia on follow-up stress testing.
**Conclusion**: A small but significant percentage of ED patients with suspected cardiac ischemia and normal resting MPI have abnormal subsequent stress testing. While normal resting MPI in such patients predicts a good short-term outcome as established in the ERASE Chest Pain and other trials, the presence of inducible ischemia on subsequent stress testing may define prognosis in the longer term, and have therapeutic implications.

1056-142 **Investigation of Myocardial-Gated SPECT Imaging as an Initial Strategy in Heart Failure: The IMAGING in Heart Failure Study**

Prem Soman, A. Lahiri, J. Mieres, D. Calnon, D. Wolinsky, G. A. Beller, T. Sias, K. Burnham, L. Conway, P. McCullough, E. Daher, M. N. Walsh, J. Wight, G. V. Heller, J. E. Udelson, Tufts-New England Medical Center, Boston, MA

*Background:* Few data exist on the prevalence of differing pathophysiologies for the *initial presentation* of heart failure (HF). *Methods:* The IMAGING in HF trial was designed to define the role of myocardial perfusion imaging (MPI) as an early evaluation strategy for HF. Pts were included if they were hospitalized for first presentation of HF, fulfilled the Framingham Study HF criteria and did not have an acute MI. Stress/rest gated SPECT Tc-99m sestamibi imaging was performed in all pts, interpreted blindly in a central lab and scored semi-quantitatively. Catheterization was performed based on all clinical and imaging data.
*Results:* 201 pts were enrolled at 14 centers, of whom 43% were women, 65% had no previous history of coronary artery disease (CAD), and 34% had diabetes. Stress testing was pharmacological in 87%. LV EF was > 40% in 36%, a proportion similar to that seen in chronic HF. Perfusion data: see Table. Among the 37% of patients who underwent coronary arteriography, MPI had a 91% sensitivity, 60% specificity and 89% negative predictive value (NPV) for significant CAD.
*Conclusions:* Gated SPECT MPI with initial presentation of HF demonstrates a distribution of ejection fractions similar to that seen in chronic HF. Extensive reversible ischemia is present in a minority of patients, with similar prevalence in pts with preserved vs impaired EF. Normal perfusion is seen in ~ 40%, and has a high NPV for excluding CAD.

Distribution of perfusion defect severity (% of pts)

| | Summed scores | Normal /none % | Mild abnormal % | Mod-severe abnormal % |
|---|---|---|---|---|
| All patients | Stress<br>Rest<br>Ischemia | 43<br>54<br>73 | 14<br>13<br>15 | 43<br>33<br>12 |
| EF < 40% | Ischemia | 74 | 14 | 12 |
| EF > 40% | Ischemia | 76 | 24 | 10 |

1056-143 **Standard Right Ventricular Apical Pacing Associated With Deterioration of Left Ventricular Function**

James H. O'Keefe, Jr., Randall C. Thompson, Ravindra Kahatapitiya, Phillip G. Jones, Brian M. Ramza, David M. Steinhaus, Mid-America Heart Institute, Kansas City, MO

**Abstract**
Left ventricular (LV) ejection fraction (EF) has a powerful influence on outcome and cardiovascular disease. We used a comprehensive prospect of nuclear database to assess determinance of substantial improvement or deterioration in LV function over time. A total of 17,000 consecutive patients were queried to identify patients with serial gated rest and stress single-photon emission computed tomography (SPECT) studies at least 6 months apart. We included only patients whose LVEF rose greater than or equal to 10 points or fell 7 points or more. Both univariable and multivariable analyses were performed to identify significant correlates of change in LVEF over time. A total of 148 patients had EF increase greater than or equal to 10 and 50 patients had EF decrease greater than or equal to 7. Only patients whose baseline LVEF was between 25% and 40% were included in the analysis. LVEF on average rose from 33% to 51% in the EF increase group and fell from 35% to 25% in the EF decrease group. The only multivariable predictor of improvement in LVEF was the use of beta blocker therapy (odds ratio 0.227, confidence limits 0.09-0.050, p=0.0003). The only multivariable predictor of deterioration of LV function was presence of a pre-existing right ventricular apical pacemaker (odds ratio =5.4, confidence limits 1.66-19.4, p=0.006).
**Conclusion**
The strongest correlate of chronic improvement in LVEF was use of beta blocker therapy. In contrast, the only significant independent predictor of deteriorating LV function over time was use of right ventricular apical pacing. These variables should be considered when choosing therapy for patients with depressed left ventricular ejection fraction.

1056-144 **Multiexpert Blinded Interpretation of Electrocardiogram-Gated SPECT Imaging in Women: Relative Performance of Thallium-201 and Technetium-99m Sestamibi**

Timothy M. Bateman, Frans JTh Wackers, Jennifer H. Mieres, Kelly L. Moutray, James A. Case, Ginger J. Hertenstein, John A. House, S James Cullom, Mid America Heart Institute, Kansas City, MO, Cardiovascular Imaging Technologies, Kansas City, MO

**Background:** Contemporary SPECT myocardial perfusion imaging emphasizes the importance of image quality and ECG-gating. No recent analysis of comparative accuracy related to choice of radionuclide has been undertaken. We studied relative perfor-